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Expanded EPACT Program

An Update

January 15, 2008

Base EPA Act Program Design

- Tier 2 fuel effects (RVP, T50, T90, Aromatics, EtOH)
- “RFS 2 Pilot” to precede main program
 - Three additional, in-use E0, E10, E15 fuels tested in all 19 vehicles at 75°F and 50°F
 - RFS 2 testing from early April till end of June, 2008
- 16 fuels, 19 vehicles in main program
- Estimated cost (Dec. 20, 2007): \$3.95M vs. previous EPA estimate of \$3.45M
 - Discussions underway with SWRI to reduce program cost
- Base Program Timeline, w/o safety margin
 - Jan. 2008 – March 2008: Fuel blending, vehicle recruiting
 - April 2008 – December 2008: Emissions testing
 - December 2008 – February 2009: Reporting
- The Base Program is already moving forward

Expanded EPAct Program

- Met with NREL in Ann Arbor on January 9 to discuss the design of the Expanded EPAct Program
- \$0.9M has been made available to NREL from DOE's Biomass Program for use in expanding the EPAct Study
 - NREL has already received a funding letter from DOE for this amount
- Additional \$1.1M is expected to become available shortly from DOE's Vehicle Technology Program
 - Funding letter expected in March
- Expanded fuel matrix includes 29 fuels
- 22 vehicles used in Phases 1 & 2, 19 vehicles in Phase 3
- DOE would also like to fund limited PM speciation work
- The add-on cost of the expanded program is estimated at \$2.0M
- Lubrizol has committed to provide lubricant support for this program

Expanded Fuel Matrix

Fuel #	T50	T90	ETOH	RVP	ARO
	°F	°F	%	psi	%
1	235	300	10	7	15
2	235	350	0	9	15
3	195	350	10	9	15
4	195	350	0	7	40
5	195	300	10	7	40
6	235	300	0	7	40
7	215	350	10	7	15
8	215	300	10	9	15
9	215	350	0	9	40
10	215	300	0	7	15
11	215	300	10	9	40
12	215	350	10	7	40
13	195	350	0	7	15
14	195	300	0	9	15
15	235	350	10	9	40
16	195	300	0	9	40
17	215	325	0	9	30
18	202	325	10	9	25
19	195	325	15	9	23
20	160	300	20	7	15
21	168	300	15	7	15
22	160	350	20	7	40
23	160	300	20	9	40
24	160	350	20	9	15
25	195	300	15	7	15
26	168	350	15	9	40
27	195	350	15	9	40
28	160	350	20	9	40
29	TBD	TBD	85	TBD	TBD

Base Program
(1-16)

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RFS 2 Subset
(17-19)

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DOE Fuels
(20-29)

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E85

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Timeline

Phase	# of Tests	# of Weeks	Duration	
			From	To
Fuel blending	-	22	2-Jan	31-May
Phase 1 (75°F)	135	5	1-Apr	6-May
50°F Switchover	-	2	7-May	20-May
Phase 2 (50°F)	135	7.5	21-May	11-Jul
Phase 3 (75°F)	1243	46	14-Jul	29-May-09
Reporting	-	12	1-Jun-09	31-Aug-09

No margin of safety

Program Cost

Base EPAct Program (19 fuels, 19 vehicles)

Phase	# of Fuels	# of Vehicles	# of Emission Tests
1	3	19	117
2	3	19	117
3	16	19	623
			857

Expanded EPAct Program (29 fuels, 19 + 3 vehic

Phase	# of Fuels	# of Vehicles	# of Emission Tests
1	3	22	135
2	3	22	135
3	25+E85	19	982
			1252

Note: Calculations assume 2.05 replicates per each fuel/vehicle combination

EX. 4 - CBI

- Both cost estimates based on SWRI proposal received on Dec. 20
- Program cost negotiations with SWRI are in progress

EX. 4 - CBI

Most Pressing Issues

- Make sure EPAAct Program is launched and completed on time
 - Alert SWRI management to the needs of EPAAct Program
 - Jeff White; Director; Light-Duty and Unregulated Emissions Section?
 - Nigel Gale; Vice President; Engine, Emissions and Vehicle Research?
 - Alert Haltermann (fuel supplier) management to the needs of EPAAct Program
 - Wayne Peterson, Commercial Director
 - If blending of fuels 17-19 is not accelerated in Haltermann's work schedule, Phase 1 testing will not start on April 1, 2008
 - E15 T50 issue must be resolved ASAP
 - Meet w/Wayne Peterson of Haltermann in Ann Arbor the wk of January 28 to drive home the message
 - Maintain close contacts with SWRI and Haltermann to make sure that time-critical issues are immediately resolved
- Finalize the design of the expanded EPAAct Program in collaboration with NREL,

Most Pressing Issues (Cont'd)

- Incorporate selected components of the expanded program in EPA SOW
 - Waiting for DOE to sign the sole source contract with SVRI would delay the whole program
 - In exchange, DOE will later fund selected components of the base program
 - Need approval to proceed

Component	Estimated Cost, \$
Additional quantities of fuels 17-19 for use in testing of 3 high emitter/mileage vehicles in Phases 1 and 2 of the program	
Recruiting of 3 high emitter/mileage vehicles for use in Phases 1 and 2 of the program	
Conditioning of engine oil in 3 high emitter/mileage vehicles	
Generation of composite PM samples in Phases 1 and 2 of the Program	
Purchase of fuels 20-29 for use in Phase 3	
Total	

Back-up Slides

Test Program Design

- Design similar to Base EPAAct Program
 - Phase 1: RFS 2 Pilot at 75°F
 - 3 fuels (E0, E10, E15) as in base program
 - 19 vehicles as in base program + 3 high emitter/mileage vehicles
 - Phase 2: RFS 2 Pilot at 50°F
 - 3 fuels (E0, E10, E15) as in base program
 - 19 vehicles as in base program + 3 high emitter/mileage vehicles
 - Phase 3: Main Program
 - 26 fuels
 - 16 fuels as in base program + 9 additional fuels + E85
 - 19 vehicles as in base program
 - Same parameters measured as in base program
 - Exception: Limited PM speciation in Phases 1 and 2